EQUISETUM FROM PENINSULA FLORIDA

DON R. REYNOLDS AND KEN CALHOUN

The first report of *Equisetum* in Florida was made in 1932 when *E. praealtum* was discovered in Northern Florida (Small, 1938). *E. robustum* is recorded from 1929 growing along the Apalachicola River at Alum Bluff. Correll (1938) lists *E. praealtum* as occurring along wet sandy stream banks in Liberty County, Florida. Schaffner (1939) maps the locality of *Equisetum* in Florida as occurring in the pan-handle of the State. Wherry (1961) lists *E. hyemale* var. *elatum* as occurring in Gadston county along the Georgia border and westward to Texas. He lists the habitat as, "sandy shores and seemingly barren areas where moisture and nutrients can be found at depth. Invading disturbed soil, fills . . ." Heretofore *Equisetum* is known only from the pan-handle area of Northwest Florida. We wish to report *Equisetum* from peninsula Florida.

Two collections have been identified as *Equisetum hyemale* var. *affine,* following Hauke (1963). This determination has been confirmed by a comparison with the specimen of G. Engelmann in the Missouri Botanical Garden, St. Louis, which is the type of this variety.

SPECIMENS EXAMINED: Florida Technological University Herbarium:

8 February 1971. *Ken Calhoun and Don R. Reynolds,* Brooksville Limestone Quarry, Liberty County, Florida. The specimens were growing in moist clay in several places in the quarry. The quarry is approximately ½ mile long and 300 yards wide and 50 feet deep. It was abandoned in 1967. There was little competition from other plants for the large *Equisetum* clones which flourished along a large water filled pit that ran the length of the quarry. The area immediately surrounding the quarry and other likely areas within a 25 mile radius were searched on several

occasions. Although several apparently suitable habitats were located, *Equisetum* seems to be restricted to the confines of the Brooksville Quarry.

9 May 1971. *Don R. Reynolds and Ken Calhoun*, Sand Quarry, approximately 10 miles east of Clermont on US Highway 50, Lake County, Florida. The specimens were growing in sandy soil which was intermittently wetted from water being pumped into the quarry as part of the dredging operation. The quarry covered about one square mile; a large part was covered with water. No vegetation was growing in the immediate proximity of the *Equisetum* clone.

Hauke (1963) has demonstrated the clinal variation between the southern states of *E. hyemale* var. *affine*, based on teeth retention, height of plants and ridge angularity. The clines of Mississippi, Alabama and Northern Florida are similar to the clines of Georgia except that the percentage of teeth retention in the Georgia clines is much lower. According to the percentage of teeth retention in the two specimens cited (80-100%), the *Equisetum* from Liberty and Lake Counties represent a southerly extension of the Mississippi, Alabama, North Florida clines rather than the Georgia one.

A third collection of Horsetail was recently given to Dr. Robert Long (Biology Department, University of South Florida) which was found growing in a ditch in Dunedin, Pinellis County, Florida. Dr. Long (personal communication) identified the plants as *Equisetum hyemale*. This collection represents the southernmost record on the Florida peninsula.

LITERATURE CITED

CORRELL, D. S. 1938. A county check-list of Florida ferns and fern allies. American Fern Journal 28: 11-15.

HAUKE, RICHARD. 1963. A taxonomic monograph of the genus *Equisetum* subgenus *Hippochaete*. J. Cramer. Stuttgart. 123 p.

SCHAFFNER, J. H. 1939. Distribution of exclusively North American species of *Equisetum*. American Fern Journal 29: 45-47.

SMALL, J. K. 1938. Ferns of the southeastern states. Hafner Co. N. Y. Reprint Edition. 517 p.

WHERRY, E. T. 1961. The southern fern guide. Southern, eastern and midland United States and adjacent Canada. Doubleday and Co., Garden City, N. Y. 318 p.

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WIND AND THE WINTER-EXPOSED PLANT. In his paper "Snow Cover and the *Diapensia lapponica* habitat in the White Mountains, New Hampshire" (Rhodora 74: 358-377), W. N. Tiffney, Jr. makes repeated reference to the prevalence of high winds in the alpine zone which, in his belief, ". . . promote desiccation in winter-exposed plants". The idea that winter desiccation is significantly influenced by high winds is shared by at least one other ecologist (Lindsay, 1971), but this conclusion seems to be based on the application of summertime wind effects to the wintertime situation. The energy budget of the winter-exposed plant is, however, quite different from that of the more freely transpiring plant in a summer microclimate, and the prevalence of high winter winds may instead forestall damaging water loss.

Transpiration from a leaf surface, at any time, is directly proportional to the water vapor concentration gradient between the leaf and air, and is inversely proportional to the diffusive resistances offered by the leaf and boundary layer of air adjacent to the leaf (Gates, 1965). Hence $T = \frac{c_l - c_a}{r_l + r_a}$ where T is the transpiration rate, $c_l - c_a$ is the water vapor concentration difference between the intercellular spaces of the leaf and the bulk air outside the leaf boundary layer, and r_l and r_a are respectively the leaf and boundary resistance to gaseous transfer. It should be noted that the driving force for transpiration, $c_l - c_a$, is strongly influenced by the temperature difference between the leaf and air, since saturation vapor pressure is a function of temperature. The greater the elevation of leaf temperature above